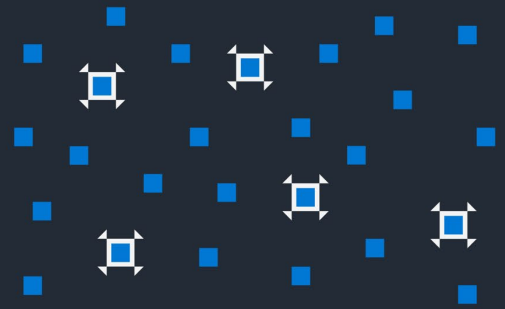


# Detecting external fraud, waste, and abuse in accountable care



## ACO financial exposure, a CMS-recognized methodology, and the path to systematic program integrity

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### Introduction

Accountable care organizations (ACOs) operating under the Medicare Shared Savings Program (MSSP) and ACO Realizing Equity, Access, and Community Health (REACH) program are financially responsible for the total Medicare Parts A and B fee-for-service (FFS) expenditures for their assigned beneficiaries, including spending generated by providers and suppliers outside the ACO's network and operational control. With 76% of MSSP ACOs bearing two-sided financial risk as of performance year (PY) 2026, fraud, waste, and abuse (FWA) by non-participant providers erodes shared savings and amplifies shared losses for ACOs.<sup>1</sup> Recent episodes demonstrate the scale of this exposure: the intermittent urinary catheter billing fraud of 2023 required emergency rulemaking under the Significant, Anomalous, and Highly Suspect (SAHS) billing provisions, and traditional Medicare spending on skin substitutes escalated from \$1.6 billion in 2022 to approximately \$10 billion in 2024.<sup>2</sup> Further rulemaking announced on March 31, 2026 addressed ongoing SAHS billing for ACO programs in 2025, including the removal of 90% of skin substitute expenditures for REACH ACOs.<sup>3</sup> Despite receiving comprehensive claims data through Claim and Claim Line Feed (CCLF) files and the Beneficiary Claims Data API (BCDA), many ACOs have not yet built the analytical infrastructure to detect these anomalies systematically, leaving them vulnerable to the negative financial impacts until it is too late to act.

The Centers for Medicare and Medicaid Services (CMS) has signaled a clear expectation that this gap be addressed. In the calendar year (CY) 2025 Physician Fee Schedule (PFS) Final Rule, CMS formally recognized ACOs as partners in identifying anomalous and highly suspect billing.<sup>4</sup> The CMS Crushing Fraud Chili Cook-Off Competition concluded in December 2025, with the Milliman Sentry platform selected as the winner based on its integration of actuarial risk adjustment with unsupervised anomaly detection—producing decomposable, evidence-backed risk scores for each provider.<sup>5,6</sup> This paper presents the financial exposure, the detection gap, the CMS-award-winning methodology, and the considerations ACOs may wish to evaluate when assessing investment in program integrity efforts.

1. Medicare Shared Savings Program. (2026, January 1). Shared Savings Program fast facts. Centers for Medicare and Medicaid Services. Retrieved April 20, 2026, from <https://www.cms.gov/files/document/2026-shared-savings-program-fast-facts.pdf>.
2. Centers for Medicare and Medicaid Services. (2025, October 31). CMS modernizes payment accuracy and significantly cuts spending waste [Press release]. Retrieved April 20, 2026, from <https://www.cms.gov/newsroom/press-releases/cms-modernizes-payment-accuracy-significantly-cuts-spending-waste>
3. Centers for Medicare and Medicaid Services. (2026, March 31). ACO REACH updates. Retrieved April 20, 2026, from <https://www.naacos.com/wp-content/uploads/2026/03/ACO-REACH-Update-20260331.pdf>
4. Centers for Medicare and Medicaid Services. (2024, November 1). Calendar year (CY) 2025 Medicare Physician Fee Schedule final rule (CMS-1807-F) - Medicare Shared Savings Program provisions [Press release]. Retrieved April 20, from <https://www.cms.gov/newsroom/fact-sheets/calendar-year-cy-2025-medicare-physician-fee-schedule-final-rule-cms-1807-f-medicare-shared-savings>.
5. Centers for Medicare and Medicaid Services. (2026, March 31). Crushing Fraud Chili Cook-off Competition. Retrieved April 20, 2026, from <https://www.cms.gov/priorities/crushing-fraud-waste-abuse/overview/crushing-fraud-chili-cook-competition>
6. Milliman. (2025, December 23). Milliman wins CMS "Crushing Fraud Chili Cook-off" competition: Groundbreaking AI solution recognized as best-in-class for combating Medicare fraud [Press release]. Retrieved April 20, 2026, from [https://media.milliman.com/v1/media/edge/images/millimaninc5660-milliman6442-prod27d5-0001/media/Milliman/PDFs/Press-releases/2025/12-23-25\\_CMS-Cook-off-Winner-Presser.pdf](https://media.milliman.com/v1/media/edge/images/millimaninc5660-milliman6442-prod27d5-0001/media/Milliman/PDFs/Press-releases/2025/12-23-25_CMS-Cook-off-Winner-Presser.pdf)

## Financial exposure

### PROGRAM SCALE AND THE EXPOSURE MECHANISM

As of January 1, 2026, 511 MSSP ACOs serve 12.6 million assigned beneficiaries. The concurrent ACO REACH Model covers an additional 1.7 million beneficiaries,<sup>7</sup> and will be succeeded by the Long Term Enhanced ACO Design (LEAD) model for PY 2027. For PY 2024, according to CMS, participating ACOs generated \$4.1 billion in shared savings payments and \$2.5 billion in net savings to Medicare, and cumulatively since 2012, MSSP ACOs have produced approximately \$35 billion in gross savings.<sup>8,9</sup> At this scale, even marginal FWA exposure compounds into material financial risk for ACOs.

ACOs are exposed to this risk as a result of methodology for calculating shared savings and losses under the CMS models. CMS compares an ACO's total Parts A and B FFS expenditures for assigned beneficiaries against a benchmark, including expenditures where the furnishing provider is not an ACO participant. For many ACOs, particularly physician-led organizations, a substantial share of expenditures for assigned beneficiaries is generated by providers outside the ACO's participant roster. For example, a fraudulent durable medical equipment (DME) supplier billing medically unnecessary items to assigned beneficiaries inflates the ACO's expenditures just as directly as excessive claim expenditures billed by the ACO's own participants. Under the ENHANCED track in MSSP, with sharing rates of up to 75%, the ACO absorbs up to 75 cents of every dollar of fraudulent external billing during reconciliation. For an ACO with 50,000 assigned beneficiaries and \$1,300 per beneficiary per month (PBPM) expenditures, a 2% impact from external FWA represents \$15.6 million in annual exposure.

### THE SAHS PRECEDENT AND UNRESOLVED SKIN SUBSTITUTE EPISODE

The intermittent urinary catheter episode concretely illustrates the exposure facing ACOs. In early 2023, 15 DME companies drove billing increases of 163% for HCPCS code A4352 and over 5,000% for A4353,<sup>10</sup> prompting CMS to stop over 99% of payments for these services and exclude the affected codes from PY 2023 expenditure calculations.<sup>11</sup> The pattern has recurred and broadened: for CY 2025, CMS determined that six HCPCS codes across three product categories meet the SAHS threshold: urinary catheters, alginate dressings, and orthotics. Milliman's analysis<sup>12</sup> of the 100% Medicare FFS DMEPOS claims identified A4352 billing in Q3 2025 as surpassing previously classified SAHS levels, driven by three TINs accounting for approximately 95% of nationwide spending on the code.

Meanwhile, in another example, traditional Medicare spending on skin substitutes escalated from \$256 million in 2019 to approximately \$10 billion in 2024, and CMS's March 31, 2026 determination revealed a divergence across programs. For MSSP, CMS concluded that existing benchmark trend and truncation mechanisms adequately mitigate the impact, estimating that over 90% of ACOs perform the same or better with skin substitute expenditures included. For ACO REACH, however, the model's stop-loss design and retrospective trend adjustment (RTA) corridor left expenditures substantially unmitigated, particularly for High Needs REACH ACOs, where skin substitutes constituted an estimated 12.6% of total expenditures, leading CMS to remove 90% of skin substitute spending and hold REACH

7. Centers for Medicare and Medicaid Services. (2026, February 4). 2026 Medicare Accountable Care Organization initiatives participation highlights [Press release]. Retrieved April 20, 2026, from <https://www.cms.gov/newsroom/fact-sheets/2026-medicare-accountable-care-organization-initiatives-participation-highlights>.

8. Medicare Shared Savings Program. (2025, September 29). Medicare Shared Savings Program Accountable Care Organizations updated performance year 2024 financial and quality results [Fact sheet]. Centers for Medicare and Medicaid Services. Retrieved April 20, 2026, from <https://www.cms.gov/files/document/fact-sheet-ssp-py24-financial-quality-results.pdf>

9. Accountable for Health. (2025, December 3). Accountability delivered in Medicare: Shared Savings Program results from 2024. Retrieved April 20, 2026, from <https://accountableforhealth.org/accountability-delivered-in-medicare-shared-savings-program-results-from-2024/>

10. Centers for Medicare and Medicaid Services. (2024, September 27). Medicare program: Mitigating the impact of significant, anomalous, and highly suspect billing activity on Medicare Shared Savings Program financial calculations in calendar year 2023. 89 Fed. Reg. 79152. Retrieved April 20, 2026, from <https://www.federalregister.gov/documents/2024/09/27/2024-22054/medicare-program-mitigating-the-impact-of-significant-anomalous-and-highly-suspect-billing-activity>.

11. Centers for Medicare and Medicaid Services. (n.d.). Urinary catheter case study: CMS' swift action saves billions. Retrieved April 20, from <https://www.cms.gov/files/document/cpi-urinary-catheter-case-study.pdf>

12. Champagne, N., & Brinkers, K. (2026, March 9). 2025 Medicare FFS catheter billing anomalies and ACO implications. Milliman. Retrieved April 20, 2026, from <https://www.milliman.com/en/insight/medicare-ffs-catheter-billing-anomalies-aco>

ACOs harmless to any downside impact.<sup>13</sup> The episode underscores that protection through existing benchmark mechanics is the result of methodology, not of systematic detection: the same billing patterns produced materially different financial impacts across program designs. Absent purpose-built detection capability, many ACOs in either program lack the infrastructure to identify the next anomalous pattern before it scales to the point of requiring federal intervention, which CMS may or may not pursue.

## THE DETECTION GAP

CMS equips ACOs with comprehensive claims data: rich datasets are delivered regularly, providing claim headers, service lines, diagnosis codes, procedure codes, provider identifiers, and payment amounts.<sup>14</sup> However, the availability of claims data at this level of detail does not, by itself, produce the analytical infrastructure required to identify and act on billing anomalies.

Many ACOs still rely on spreadsheet-based workflows to manage complex financial and operational data, and some repurpose general-population health analytics platforms for anomaly detection and investigation of potential FWA rather than using purpose-built program integrity tools.<sup>15</sup> This labor-intensive process can surface only the most conspicuous anomalies and cannot evaluate provider behavior against risk-adjusted peer baselines at the service-code level. These workflows lack the machine-learning algorithms necessary to identify novel fraud patterns without predefined rules. Specialized FWA detection systems possess more advanced capabilities but have historically oriented their solutions toward commercial payers, who operate with network visibility, claims adjudication authority, and pre-payment editing controls that ACOs do not possess in the FFS Medicare environment.

The result is a landscape in which real-time detection workflows rarely exist—many ACOs lack cross-ACO network visibility to identify multi-geography fraud syndicates, no standardized framework defines anomalous provider behavior in the ACO context, and no rapid reporting channel connects ACO analytical findings to CMS enforcement. CMS's own catheter case study documents statistical warning signs, including sharp, multi-thousand-percent billing increases concentrated among a small group of suppliers, that systematic CCLF monitoring could have surfaced well before the anomaly reached the scale that prompted federal action.<sup>16</sup> Analytics that leverage the 100% Medicare sample can bridge this visibility gap, identifying billing anomalies that no single ACO's CCLF data could reveal independently.<sup>17</sup>

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13. Centers for Medicare and Medicaid Services. (2025, October 31). CMS modernizes payment accuracy and significantly cuts spending waste [Press release]. Retrieved April 20, 2026, from <https://www.cms.gov/newsroom/press-releases/cms-modernizes-payment-accuracy-significantly-cuts-spending-waste>

14. Beneficiary Claims Data API. (n.d.). Comparison of BCDA and CCLF files. Retrieved April 20, 2026, from <https://bcda.cms.gov/bcda-data/comparison-bcda-cclf-files.html>

15. Mattina, C. (2025, April 23). ACOs' focus on rooting out fraud aligns with CMS vision under Oz. *American Journal of Managed Care*. 31(6), SP382–SP383. Retrieved April 20, 2026, from <https://www.ajmc.com/view/acos-focus-on-rooting-out-fraud-aligns-with-cms-vision-under-oz>

16. Centers for Medicare and Medicaid Services. (n.d.). Urinary catheter case study: CMS' swift action saves billions. Retrieved April 20, 2026, from <https://www.cms.gov/files/document/cpi-urinary-catheter-case-study.pdf>

17. Milliman maintains a license to the 100% Medicare Fee-for-Service Limited Data Set, encompassing Parts A, B, and D claims as well as DMEPOS claims nationwide. This national scope enables detection of billing anomalies that span multiple ACO populations, geographic regions, and Medicare Administrative Contractor jurisdictions, and provided the basis for Milliman's identification of the recurring A4352 catheter billing anomalies in Q3 2025 described earlier in this paper

## The CMS “Crushing Fraud” Chili-Cookoff

In 2025, CMS launched the Crushing Fraud Chili Cook-Off Competition to identify detection methodologies capable of surfacing anomalous billing patterns in Medicare claims data through explainable AI and machine learning.<sup>18</sup> CMS selected ten finalist teams from 259 entries to advance to Phase 2 of the competition, where each team was granted access to the Medicare FFS Part B, Hospice, and DME Limited Data Sets (LDSs). On December 15, 2025, CMS selected Milliman as the competition winner.<sup>19</sup> Since that time, Milliman has built on that winning framework to develop Milliman Sentry, an explainable AI platform designed to detect and quantify potential FWA.

The CMS Chili Cook-Off evaluation criteria emphasized three dimensions: explainability (the ability to articulate why a provider was flagged), novelty (the capacity to detect patterns not captured by existing rule-based systems), and practical applicability (the feasibility of implementation within CMS’s operational environment). The emphasis on explainability aligns with the CMS AI Playbook’s frameworks for auditable data lineage and defensible algorithmic decision-making.<sup>20</sup> The selection of an actuarially grounded approach suggests that CMS views false-positive reduction as essential to operational viability—detection systems that generate excessive false alerts impose investigative costs that offset their value.

### Crushing Fraud Chili Cook-Off Competition (CMS)

In December 2025, CMS hosted the [Crushing Fraud Chili Cook-Off competition](#), a market-based research challenge that asked participants to develop explainable AI models capable of detecting anomalies in Medicare claims data. On December 15, 2025, CMS selected Milliman as the competition winner.

**Since then, Milliman has built on that winning framework to develop Milliman Sentry, an explainable AI platform designed to detect and quantify potential FWA.**

18. Centers for Medicare and Medicaid Services. (2026, March 31). Crushing Fraud Chili Cook-off Competition. Retrieved April 20, 2026, from <https://www.cms.gov/priorities/crushing-fraud-waste-abuse/overview/crushing-fraud-chili-cook-competition>

19. U.S. House Committee on Energy & Commerce, Subcommittee on Oversight and Investigation. (2026, March 17). Statement of Kim Brandt, Deputy Administrator & Chief Operating Officer, Centers for Medicare & Medicaid Services, on “Protecting patients and safeguarding taxpayer dollars: The role of CMS in combatting Medicare and Medicaid fraud”. Retrieved April 20, 2026, from [https://democrats-energycommerce.house.gov/sites/evo-subsites/democrats-energycommerce.house.gov/files/evo-media-document/witness\\_testimony\\_oi\\_brandt\\_03.17.2026.pdf](https://democrats-energycommerce.house.gov/sites/evo-subsites/democrats-energycommerce.house.gov/files/evo-media-document/witness_testimony_oi_brandt_03.17.2026.pdf)

20. CMS AI Explorers. (2025, September 12). CMS artificial intelligence playbook, version 4. Centers for Medicare and Medicaid Services. Retrieved April 20, 2026, from <https://ai.cms.gov/CMS-AI-Playbook.pdf>

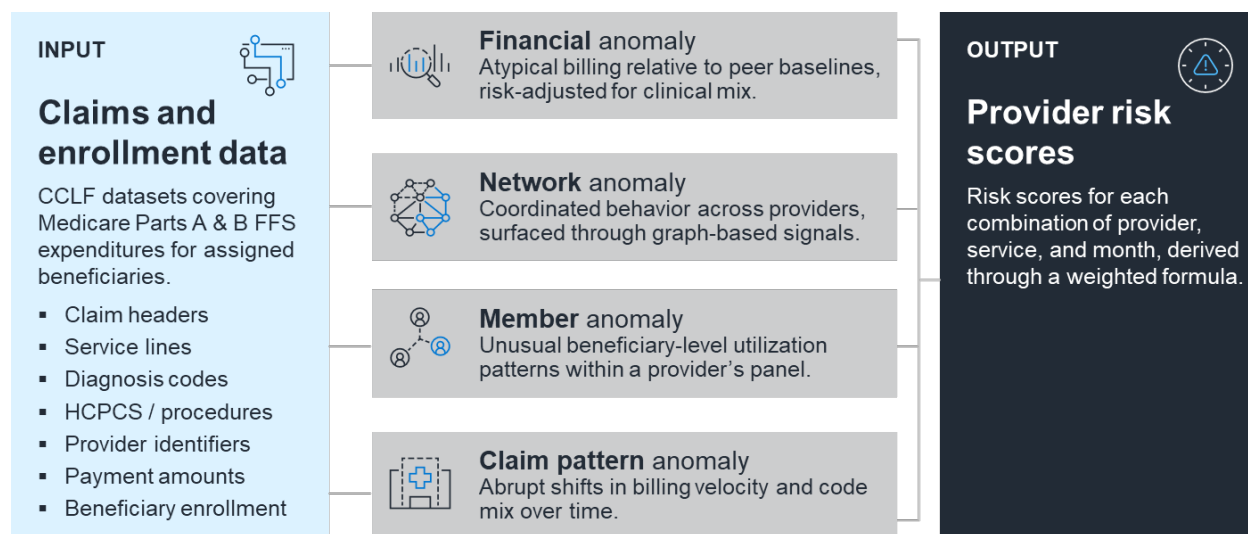
## Methodological framework

Milliman Sentry addresses three questions compliance officers and investigators raise when evaluating any FWA detection system: what does it identify, how does it control false positives, and can its findings withstand scrutiny?

### DETECTION DIMENSIONS

The methodology targets traditional FFS-pattern FWA flowing through ACO expenditure calculations, evaluated across four complementary dimensions—financial, network, member, and claim pattern anomalies (Figure 1).

FIGURE 1: MULTI-DIMENSIONAL FWA DETECTION FRAMEWORK.



These dimensions operate in parallel. Their outputs are combined through a weighted composite formula integrating a financial materiality scaler—ensuring that risk scores reflect both the degree of anomaly and the dollar exposure, directing investigative resources toward the highest-impact cases.<sup>21</sup>

### FALSE-POSITIVE CONTROL

A provider treating a disproportionately complex population will naturally incur higher costs; flagging such providers as potentially engaged in fraud wastes investigative resources and undermines credibility. The Sentry platform addresses this through three mechanisms.

- **Risk adjustment through weighted recipient months:** Provider-level metrics are normalized for patient acuity using weighted recipient months, borrowing techniques from actuarial rate-setting methodology. Beneficiaries are stratified by Medicare status, age, and gender, and a relative cost factor (RCF) is calculated for each stratum. A provider's weighted recipient months equals the product of patient count and weighted RCFs, adjusting the denominator for expected resource intensity. This is conceptually analogous to Hierarchical Condition Category (HCC)-based risk adjustment in the MSSP, but operates at a finer level of granularity. HCC risk scores are beneficiary-level composites designed for total-cost-of-care prediction and do not vary across service categories. The RCF approach adjusts at the beneficiary-service-category level, producing a more targeted expected-cost baseline for each provider.

21. Risk scores produced by any statistical detection system represent measures of deviation from peer benchmarks and indicate areas warranting further review. They do not constitute conclusions of fraudulent intent or misconduct

- **Hierarchical peer grouping:** Each provider is assigned to the most granular peer group achieving a minimum of 30 providers, segmented by HCPCS code. The algorithm starts at the most specific tier (specialty, county, state, and operational capacity as measured by the provider's historical recipient count) and cascades to broader definitions only when necessary. A rural family physician in a county with 40 peers billing the same code is compared at that tier; a subspecialist in a small market may cascade to the state level.
- **Leave-one-out baselines:** Each provider's deviation scores are calculated against a peer group that excludes the target provider's own data, preventing extreme billing behavior from pulling the benchmark toward the anomaly.

## RISK-RANKED PROVIDER LISTING

Anomaly detection outputs are operationally valuable only to the extent that they can be translated into prioritized compliance workflows. Sentry delivers scored provider listings through an access-controlled dashboard interface, ranked by provider risk score and filterable by incurred month, provider type, HCPCS code, and risk score range.

The listing supports two complementary functions. The first is risk-ranked triage: identifying which providers exhibit the most statistically atypical billing patterns relative to their peers. The second is financial prioritization: surfacing the dollar exposure associated with each flag so that investigative resources can be directed toward cases where the potential impact justifies further review. The financial materiality scaler ensures that the provider risk score reflects both dimensions, but the platform's design preserves the underlying components so that compliance personnel can apply their own judgment to the prioritization decision. The drill-through capability allows investigators to navigate directly from any row to the corresponding evidence package for that provider.

## AUDITABILITY AND PROVIDER EVIDENCE PACKAGES

Milliman Sentry allows users to navigate to a structured evidence package generated for every scored provider, providing the documented basis necessary to evaluate whether a flag warrants referral to the Office of the Inspector General (OIG) or a Unified Program Integrity Contractor (UPIC). Each package contains peer-group context, metric-by-metric deviations, affiliated providers, and financial impact estimates, organized so that a compliance officer reviewing a critical-risk flag can trace every component of the score to specific billing behaviors and peer comparisons without data science expertise. The composite score maps to a four-tier risk classification. Providers may be flagged as high-risk due to several factors, such as PRPM utilization and spending well above peers, a high concentration in a single HCPCS code, an abrupt change in the volume of services, or connections to other high-risk providers.

## Validation and enforcement alignment

To test alignment with real-world enforcement, we employed a blind validation protocol: the model was executed on the Medicare 5% LDS (2022–2024) without training on or prior knowledge of active investigations. Providers were scored across four anomaly dimensions—financial, network, member, and claim pattern—and classified into a four-tier risk framework. A small fraction of scored providers, well under 1%, accounted for a disproportionately large share of total paid claims in the Medicare 5% LDS, consistent with the well-documented concentration of Medicare improper payments among a small number of high-billing outliers. Subsequent independent spot checks of highest-tier providers revealed that numerous flagged entities were subjects of existing federal indictments, civil monetary penalties, or major settlements.

**FIGURE 2: EXAMPLES OF CONFIRMED CASES OF MEDICARE FWA INDEPENDENTLY IDENTIFIED BY MILLIMAN SENTRY**

CASE TYPE	ENFORCEMENT ACTION	ALLEGED AMOUNT
Laboratory collusion ring (TX)	Owner charged in respiratory pathogen testing scheme	\$79 million <sup>22</sup>
DME fraud ring (FL/NC)	Owner pleaded guilty in money laundering conspiracy	\$100 million <sup>23</sup>
Mobile cardiac PET provider	Settlement with DOJ for allegedly unlawful payments	\$85 million <sup>24</sup>
Kickback scheme	Settlement with DOJ to resolve kickback allegations	\$17 million <sup>25</sup>
False Claims Act violations	Owner indicted	\$8.7 million <sup>26</sup>

## Application to ACO operations

Milliman Sentry operates on CCLF data that ACOs already receive—no additional data procurement is required. The underlying architecture is designed to be extensible to supplementary data sources as ACOs' analytical environments evolve.

- For **compliance officers**, the tiered risk framework transforms the compliance function from reactive investigation to proactive, prioritized monitoring. Critical-risk cases warrant immediate investigation; high-risk cases justify targeted audit; moderate-risk cases are placed on watchlists. The evidence package provides the documented, quantitative basis that federal reporting channels require.
- For **CFOs and finance leaders**, the financial materiality framework translates statistical anomalies into dollar-denominated risk exposure, surfacing the FWA component of expenditure variance as it accumulates rather than retroactively at reconciliation—providing adequate lead time to evaluate escalation pathways.

22. U.S. Department of Justice. (2024, November 20). Laboratory owner charged for \$79M fraud scheme [Press release]. Retrieved April 20, 2026, from <https://www.justice.gov/archives/opa/pr/laboratory-owner-charged-79m-fraud-scheme>.

23. U.S. Department of Justice. (2025, February 4). Man pleads guilty to conspiracy to launder money in connection with \$100 million health care fraud scheme [Press release]. Retrieved April 20, 2026, from <https://www.justice.gov/usao-mdnc/pr/man-pleads-guilty-conspiracy-launder-money-connection-100-million-health-care-fraud>.

24. U.S. Department of Justice. (2023, October 10). Mobile cardiac PET scan provider and founder to pay \$85 million to resolve allegedly unlawful payments to referring doctors [Press release]. Retrieved April 20, 2026, from <https://www.justice.gov/archives/opa/pr/mobile-cardiac-pet-scan-provider-and-founder-pay-85-million-resolve-allegedly-unlawful>

25. United States Attorney's Office, Northern District of Georgia. (2025, January 23). C.R. Bard, Inc. and affiliates pay \$17 million to resolve allegations of healthcare kickbacks [Press release]. U.S. Department of Justice. Retrieved April 20, 2026, from <https://www.justice.gov/usao-ndga/pr/cr-bard-inc-and-affiliates-pay-17-million-resolve-allegations-healthcare-kickbacks>

26. United States Attorney's Office, Western District of Washington. (2025, May 9). Indian citizen charged in multi-million-dollar health care fraud scheme. U.S. Department of Justice. Retrieved April 20, 2026, from <https://www.justice.gov/usao-wdwa/pr/indian-citizen-charged-multi-million-dollar-health-care-fraud-scheme>

- **For data and analytics teams**, automated scoring at the provider-HCPCS-month level replaces manual spreadsheet-based CCLF analysis, functioning as an early warning system that can identify emerging billing anomalies before they scale.

Although the most conspicuous fraud cases (e.g., fabricated claims or phantom suppliers) may ultimately require federal enforcement action, the broader spectrum of waste and abuse offers ACOs more immediate operational levers. An ACO that identifies anomalous billing or utilization patterns can encourage referrals to other providers, engage the provider's practice through outreach, or adjust care coordination protocols to guide beneficiaries toward more efficient alternatives—all within the constraints of beneficiary freedom of choice under traditional Medicare. These actions do not require federal investigation or CMS intervention. Rather, they fall within the ACO's existing care-management and provider-engagement capabilities. Detection of waste or abuse at the provider-HCPCS level thus creates value even when the identified patterns fall short of the evidentiary threshold for an OIG or UPIC referral.

## Considerations for ACOs

ACOs assessing their program integrity posture may wish to evaluate whether their existing CCLF analysis can identify billing anomalies among nonparticipant providers systematically—not only obvious volume spikes but also multidimensional patterns that traditional monitoring may not capture. They should also consider whether their compliance plan governance includes defined escalation thresholds and documentation standards for analytical findings, whether their detection capability addresses both the financial dimension (quantifying exposure) and the evidentiary dimension (producing findings that support a referral without additional investigation), and whether detection outputs are accessible to compliance officers without data science expertise.

CMS's evaluation criteria for the Chili Cook-Off Competition—explainability, novelty, and practical implementation—may serve as a useful framework for evaluating any detection approach, whether internally developed or externally sourced.

## Limitations and qualifications

Regulatory and policy information presented in this paper is current as of publication in April 2026; subsequent rulemaking, sub-regulatory guidance, or legislative action may alter the landscape described here.

The CMS Chili Cook-Off Competition was conducted on the Medicare 5% LDS, a systematic sample of Medicare FFS claims spanning 2022 through 2024. Performance on the full 100% population, on ACO-specific CCLF data, or on other non-Medicare populations may differ due to sample size, geographic representation, population composition, and differences in claims data structure. Peer group construction on a single ACO's assigned population may produce smaller peer groups for certain specialties and geographic areas than the national LDS, and ACO-specific calibration of statistical thresholds may be necessary.

Risk scores are statistical indicators of deviation from peer benchmarks and do not constitute determinations of fraud, waste, or abuse. False positives are inherent in any anomaly detection system, and human adjudication by qualified compliance and clinical personnel remains essential. Certain patterns may evade detection, including collusion that mimics normal billing distributions, low-dollar high-volume fraud below materiality thresholds, and fraud by ACO participant providers, which presents a different exposure mechanism from the external FWA addressed here.

Guidelines issued by the American Academy of Actuaries require actuaries to include their professional qualifications in all actuarial communications. Emma Kramer and Anders Larson are members of the American Academy of Actuaries and meet the qualification standards for performing the analyses in this correspondence.

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